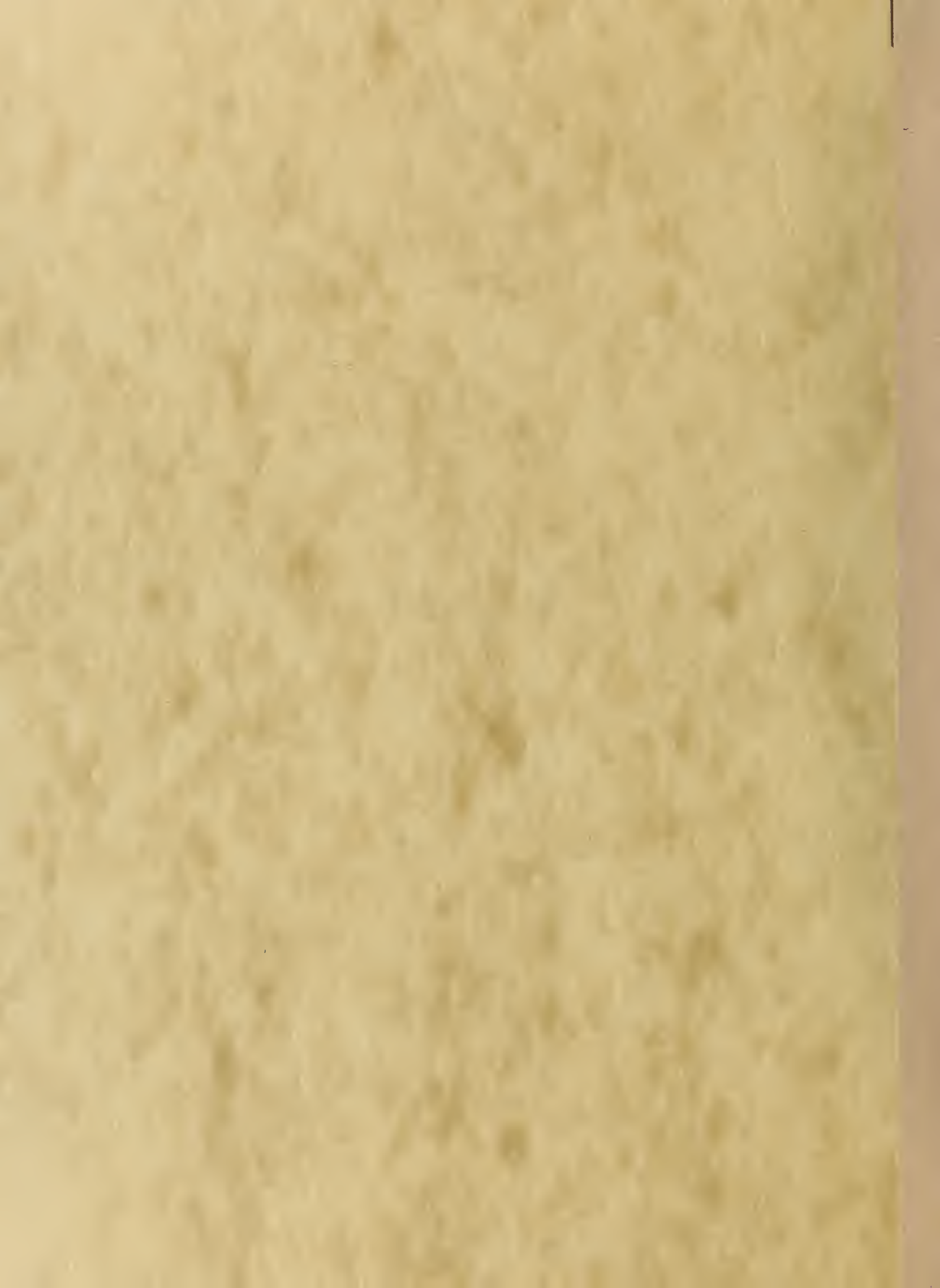



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Herbicide Guide 1977

FOR COMMERCIAL VEGETABLE GROWERS

WEED GROWTH reduces vegetable growers' income in the United States by millions of dollars annually as a result of lower yields, poorer quality, and added labor in harvesting and processing.

This guide should be used together with the grower's knowledge of soil types and the crop and weed history of the area to be treated. Whether to use herbicides or other means of weed control depends in part on the severity of past weed infestations. In many instances mechanical control is sufficient, or it may be needed in addition to herbicide use. Several herbicides may be suggested for some crops. These herbicides have shown good control with no injury to the vegetables under test conditions. Not all herbicides cleared for use on a species are necessarily listed. Where the choice of more than one herbicide is suggested, the decision rests with the grower and is based on his knowledge of past weed infestation and cost of material. Where one herbicide will not control the weeds present, a combination of herbicides may be suggested. When using an herbicide for the first time, use a small-scale trial.

These suggestions for chemical weed control in vegetables are based on research at the Illinois Agricultural Experiment Station, the U.S. Department of Agriculture, and other research institutions. The University of Illinois and its agents assume no responsibility for

results from the use of these herbicides, whether or not they were used in accordance with suggestions, recommendations, or directions of the manufacturer or any governmental agency.

Reading the label of the herbicide container is the most profitable time you spend in weed control. Use of the material and methods of application and use depend on registration of the herbicide by federal and state Environmental Protection Agencies (EPA). Do not use any herbicide *unless the label states that it is cleared for the use on the crop to be treated.*

Where mixtures of chemicals are applied, the *user* will assume the responsibility for freedom from residues if such applications are not labeled by the EPA as a mixture.

Suggestions sometimes change during the growing season, based on EPA clearances that were made after this circular was issued. This publication is printed only once each year, and is therefore subject to change without notification.

Watch for notice of changes in EPA registration of herbicides (as released by the EPA) in the Illinois Vegetable Farmer's Letter. A subscription form for this newsletter is available from 116 Mumford Hall, University of Illinois, Urbana 61801.

NOTE: In the suggestions table on the following pages, the trade names of the herbicides are usually used. The list immediately below shows trade names and their corresponding common names.

Common name	Trade name	Common name	Trade name	Common name	Trade name
alachlor	Lasso	dalapon	Basfapon, Dowpon	metribuzin	Lexone, Sencor
atrazine	AAtrex and others	DCPA	Dacthal	naptalam	Alanap
benefin	Balan	dinitramine	Cobex	nitrofen	TOK
bensulide	Prefar	dinoseb	Premerge, Sinox	profluralin	Tolban
butylate	Sutan+	diphenamid	Dymid, Enide	propachlor	Bexton, Ramrod
CDAA	Radox	diuron	Karmex	pyrazon	Pyramin
chloramben	Amiben	EPTC	Eptam	simazine	Princep
chlorbromuron	Maloran	glyphosate	Roundup	trifluralin	Treflan
chlorpropham	Furloc	linuron	Lorox	Petroleum solvent ..	Stoddard Solvent
cyanazine	Bladex	MCPA	Numerous	2,4-D (amine)	Numerous
cycloate	Ro-Neet	MCPB	Numerous		

USE THESE SUGGESTIONS IN 1977 ONLY

<i>Crop</i>	<i>Herbicide</i>	<i>Rate of active ingredient per acre actually covered¹</i>	<i>Weeds controlled</i>	<i>Best time of application (based on crop stage)</i>	<i>Remarks, cautions, limitations</i>
Asparagus (seedlings)	Amiben	3 lb.	Annuals	Immediately after seeding	Irrigation or rainfall after treatment will give maximum control.
Asparagus (established plantings)	dalapon	5-10 lb.	Perennial grass	End of harvest season following disking	Apply when grass weeds are 3 to 4 inches tall. Direct spray under fern growth. Use surfactant as directed on label.
	Karmex	3 lb.	Annuals	In spring before spears emerge or immediately following harvest, or both	Apply after disking. Do not exceed 6 lb. per growing season. Use lighter rate on sandy soil.
	Princep	3-4 lb.	Annuals	In spring and after harvest	Apply after disking. Do not treat during last year in asparagus because of residue. With Karmex and Princep—usually weed infestation will be reduced and spring application may be sufficient after first year.
Beans, lima and dry	Amiben	2-3 lb.	Broad spectrum of annual weeds	Immediately after seeding	Field may be rotary-hoed without destroying herbicide action. Do not feed foliage to livestock.
	Treflan	0.5-0.75 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	Plant crop immediately or within 3 weeks after application. Can be used up to 1 lb. on dry beans.
Beans, snap	Eptam	3 lb.	Annual grasses and nutgrass ³	Preplant soil application Incorporate with soil immediately	Plant crop immediately or within 3 weeks after application. Do not feed treated plant parts to livestock.
	Treflan	0.5-0.75 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	
	Dacthal	6-10 lb.	Annuals ⁴ (primarily grasses)	Immediately after seeding	
Beans, dry	Cobex	0.3-0.6 lb.	Annuals	Preplant soil incorporation	
Beans, dry, lima, and snap	Tolban	0.5-1 lb.	Primarily annual grasses	Preplant soil incorporation	
Beets, garden	Pyramin	4 lb.	Annuals (primarily broad-leaved)	Preemergence or after beets emerge and before weeds have two true leaves	Where grasses are a severe problem, use 4 lb. Pyramin + 4 lb. Ro-Neet.
	Ro-Neet	4 lb.	Annual grasses	Preplant soil application Incorporate with soil immediately	Use a combination treatment with Pyramin to broaden control spectrum.
Broccoli Brussels sprouts Cabbage Cauliflower	Preemergence — direct-seeded				
	Treflan	0.5-0.75 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	Stunting or growth reduction may occur at recommended rates under growth stress conditions.
	Dacthal	6-10 lb.	Annuals ⁴ (primarily grasses)	Immediately after seeding	Can also be used preemergence on transplants.
	Preemergence — transplanted				
	Treflan	0.5-1 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	Transplant after application to 3 weeks later.
Carrots	Postemergence — direct-seeded or transplanted				
	TOK ⁵	3-5 lb.	Broad-leaved weeds ⁶	One to 2 weeks after crop emergence or transplanting, while weeds are in seedling stage	Use wettable powder formulation to reduce injury potential. Use in combination with preplant or preemergence material for annual grass control.
	Preemergence				
	Treflan	0.5-1.0 lb.	Annuals ² (primarily grasses)	Preplant soil incorporation Incorporate with soil immediately	Seed after application to 3 weeks later.
	Postemergence				
	Lorox	1-1.5 lb.	Annuals	Postemergence on carrots only after crop is 2-6 inches tall	Do not feed treated foliage to livestock or replant treated area for 4 months.
	TOK	3-5 lb.	Broad-leaved weeds ⁶	While weeds are in seedling stage	Can also be used on celery and parsley. Use in combination with preplant or preemergence material for annual grass control.
	Stoddard Solvent	60-80 gal.	Annuals	After two true leaves have appeared (do not apply to carrots or parsnips after they are 1/4 inch diameter, since oily taste may result)	Most effective when sprayed on cloudy days or during high humidity, and when weeds are not more than 2 inches high. May not control ragweed. Do not apply within 40 days of harvest. Can also be used on celery, dill, parsnips, and parsley.

¹ Based on active ingredients (actual amount of active herbicide in material or acid equivalent). Use lower rate on sandy soil and higher rate on clay and loam soils. When using a band application over the row, adjust amount of material applied to the part of an acre treated. See Illinois Circular 1047.

² May not control ragweed and panicum. ³ May not control smartweed. ⁴ May not control ragweed, smartweed, and velvetleaf. ⁵ Use of 50% wettable powder is suggested for cabbage and horseradish. ⁶ May not control ragweed or chickweed. Grass control is sometimes marginal. ⁷ May not control crabgrass. ⁸ Do not use Alanap Plus, Solo, Whistle, or Amoco Soybean herbicide. These materials all contain Alanap plus another ingredient that may cause injury. ⁹ May not control smartweed and velvetleaf.

<i>Crop</i>	<i>Herbicide</i>	<i>Rate of active ingredient per acre actually covered¹</i>	<i>Weeds controlled</i>	<i>Best time of application (based on crop stage)</i>	<i>Remarks, cautions, limitations</i>
Corn, pop	Preemergence				
	atrazine	2-3 lb.	See sweet corn	See sweet corn	See sweet corn <i>except section on combinations</i> . May injure crop on light sandy soil. Has been shown to have less soil residue than atrazine. Plant only crops so specified on the label the following year. Do not graze treated areas.
	Bladex	2.5-4 lb.	Annuals	Preemergence	
	Princep	2-3 lb.	Annuals	Preemergence	
	Postemergence				
	2,4-D	0.5 lb.	Broad-leaved weeds	Postemergence	Apply when corn is 3 to 10 inches tall.
Corn, sweet	Roundup	2-3 lb.	See remarks	See remarks	Use for quackgrass or Johnsongrass control. Apply to quackgrass when 6 to 8 inches tall in fall or spring. Apply to Johnsongrass when at least 12 inches tall and actively growing. Do not till until 3 to 7 days after application.
	Preemergence				
	atrazine	2-3 lb.	Annuals, annual and perennial grasses ⁷	Preemergence, apply no later than 3 weeks after seeding. Shallow cultivation may improve weed control during dry weather	Grow corn a second year without atrazine treatment. This chemical has a high soil residue. Do not plant other vegetable crops on a sprayed area until a second year of corn has been grown. Use atrazine where quackgrass is a problem. Residue hazard decreased when banded or in combination with Lasso, propachlor, or Sutan.
	Bladex	2.5-4 lb.	Annuals	Preemergence	
	Lasso	2-2.5 lb.	Annuals	Preemergence	
	propachlor	4-5 lb.	Annuals	Preemergence	May injure crop on light sandy soil. Has been shown to have less soil residue than atrazine.
	Sutan +	3-4 lb.	Primarily annual grasses	Preplant soil application. Incorporate with soil	Preplant incorporation may aid control of nutgrass. Do not apply in nitrogen solutions.
	Preemergence combinations				Do <i>not</i> use on sandy soils. Is an excellent herbicide on high organic matter soils.
	atrazine plus Lasso	1.5 lb. +2.0 lb.	Annuals and perennial grasses	Preemergence or preplant incorporated	Use on sandy soil and where nutgrass is a problem.
	atrazine plus propachlor	1.5 lb. +3 lb.	Annuals and perennial grasses	Preemergence	See label for slightly higher rate of Lasso for preplant incorporated.
	atrazine plus Sutan +	1 lb. +3-4 lb.	Annuals and perennial grasses	Preplant soil incorporation. Incorporate with soil immediately	Use to reduce atrazine residue.
	Bladex plus Lasso	1-2 lb. +2 lb.	Annuals	Preplant soil incorporation. Incorporate with soil	Use where nutgrass is a problem and to reduce atrazine residue.
	Bladex plus Sutan +	1-2 lb. +3-4 lb.	Annuals	Preplant soil incorporation. Incorporate with soil	
	Postemergence				
	2,4-D (amine)	0.5 lb.	Broad-leaved weeds	Postemergence	Use where nutgrass is a problem and to broaden annual grass control.
	atrazine	2 lb.	Annuals, annual and perennial grasses ⁷	Directed spray 3 weeks after emergence	Preferably, apply before corn is 6 inches tall. If corn is over 12 inches reduce rate to ¼ lb.
	Roundup	2-3 lb.	See remarks	See remarks	Can be combined with crop oils for postemergence application as an emergency measure. This may increase residue the following year. Preemergence use preferred. Do not graze or feed treated foliage for 21 days after treatment.
Cucumbers Muskmelons Watermelons	Alanap ⁸	3-5 lb.	Annuals ⁸	Immediately after seeding or transplanting	Use for quackgrass or Johnsongrass control. Apply to quackgrass when 6 to 8 inches tall in fall or spring. Apply to Johnsongrass when at least 12 inches tall and actively growing. Do not till until 3 to 7 days after application.
		3-3.5 lb.		After transplanting or vining	Do not use on cold soil. Rainfall or irrigation after treatment gives maximum control.
	Prefar	4-6 lb.	Annuals (primarily grasses)	Preplant soil incorporation. Incorporate with soil immediately	Use granular form. Keep away from foliage. Apply to soil after weeds have been removed.
	Prefar plus Alanap ⁸	4 lb. +2-3 lb.	Grasses and broad-leaved weeds	Preplant soil incorporation for Prefar; Alanap as an immediate postseeding application.	Is primarily a grass killer. Consult label for sensitive crops within 18 months after application. Prefar can be used in rotation with tomatoes, broccoli, cauliflower, lettuce, carrots, onions, and summer squash within 18 months of application.
Eggplant	Dacthal	6-10 lb.	Annuals ⁴ (primarily grasses)	Immediately after transplanting	Has value for broad spectrum weed control. Consult label for sensitive crops within 18 months after Prefar application. Has EPA approval as a tank mixture.

(See footnotes on page 2.)

<i>Crop</i>	<i>Herbicide</i>	<i>Rate of active ingredient per acre actually covered¹</i>	<i>Weeds controlled</i>	<i>Best time of application (based on crop stage)</i>	<i>Remarks, cautions, limitations</i>
Greens	Dacthal	6-10 lb.	Annuals ⁴ (primarily grasses)	Immediately after seeding	For use on collards, kale, mustard greens, and turnips.
	Treflan	0.5-0.75 lb.	Annuals ² (primarily grasses)	Preplant soil application. Incorporate with soil immediately	For use on collards, kale, mustard greens, and turnip greens.
	Furloe	1-2 lb.	Primarily broad-leaved annuals	Preemergence	For spinach only. Use lower rates in cool, wet weather.
Horseradish	Dacthal	6-10 lb.	Annuals ⁴ (primarily grasses)	Immediately after transplanting	Use for annual grass control and combine with TOK as an early postemergence treatment for broad-leaved weeds.
	TOK ⁵	3-5 lb.	Broad-leaved weeds ⁶	Before weeds are 1 inch tall	Will not consistently control weeds over 1 inch tall. Some emerging annual grass may be controlled by this treatment. Lower rate will control seedling purslane.
Lettuce	Balan	1.5 lb.	Annuals	Preplant soil incorporation Incorporate with soil immediately	Is primarily a grass killer. Seed after application to 3 weeks later. Do not plant wheat, barley, rye, grass, onions, oats, beets, or spinach for 12 months after application.
Onions	Preemergence Dacthal	6-10 lb.	Annuals ⁴ (primarily grasses)	Immediately after seeding or transplanting	May not kill smartweed or common ragweed. Can be used on seeds, sets, or seedlings. Use only on mineral soils. Use lower rates on sandy soils. A double application of Dacthal can be used at seeding, layby, or both. In most situations, the weed spectrum on mineral soils will respond well to a combination of Dacthal preemergence and TOK postemergence.
	Randox	4-6 lb.	Annuals ⁹ (primarily grasses)	Just before onions emerge	Use on muck soils. Heavy rainfall may reduce stand. Very effective on purslane and pigweed.
	Postemergence TOK	3-4 lb.	Broad-leaved weeds	When weeds are in seedling stage and not over 1 inch tall	Use a single application of E.C. or W.P. per growing season. Do not apply E.C. until onions are in the two- to three-leaf stage. <i>Preemergence</i> use of TOK with heavy rainfall may reduce stand. Use in combination with preplant or preemergence material for annual grass control.
	Furloe	3-6 lb.	Broad-leaved weeds (especially smartweed)	On seeded onions: loop stage or after three- to four-leaf stage	In the later sprays, direct at base of onion plant. If more than one application is applied do not exceed 6 lb. per acre for the season. <i>Use lower rates in cool, wet weather.</i> Use no later than 30 days before harvest.
Peas	propachlor	4-4.9 lb.	Annuals	Preemergence	Do <i>not</i> use on sandy soil.
	Treflan	0.5-0.75 lb.	Annuals ²	Preplant soil incorporation Incorporate with soil immediately	Seed after application to 3 weeks later. Some reduction of growth and stand reduction possible under stress.
	Cobex	0.3-0.5 lb.	Annuals	Preplant soil incorporation	TRIAL USE IN 1977.
	MCPB	1 lb.	Broad-leaved weeds and	When peas are 3-7 inches tall and no later than four nodes prior to pea blossom	May delay maturity 1 to 4 days. Use at least 20 gal. of water per acre. Do not feed vines to livestock.
	MCPA	0.25-0.5 lb.	Canada thistle		MCPA is more effective on mustard. MCPB is less injurious to peas.
	dinoseb	0.3-9 lb.	Annuals (primarily broad-leaved)	Preemergence or postemergence	Preemergence use 6 to 9 lb. Postemergence use 0.3 to 1.1 lb. Apply prior to bloom when peas are 2 to 8 inches tall. See label for further precautions.
Potatoes, Irish	Eptam	3-6 lb.	Annual grasses and nutgrass ³	Drag-off treatment at emergence or preplant soil application Incorporate with soil immediately	Use lower rate on sandy soil.
	Treflan	0.5-1 lb.	Annuals ² (primarily grasses)	Drag-off treatment at emergence	Use a light incorporation.
	Lorox	1-2 lb.	Annuals	At very start of potato emergence	Plant tubers at least 2 inches deep. Do not replant treated area to other crops for 4 months after treatment. May injure crop on light sandy soil.
	chlorbromuron	2-3 lb.	Annuals	At very start of potato emergence	May injure crop on light sandy soil. Do not harvest immature potatoes. Do not plant crops other than field corn, potatoes, or soybeans for 6 months after applying.
	dalapon	7 lb.	Quackgrass	Before plowing in spring; wait 4 days before plowing and planting	Not for fields intended for red-skinned varieties or White Rose. Do not plant potatoes for 4 weeks. Use surfactant as directed on label.
	metribuzin	0.25-1 lb.	Annuals (primarily broad-leaved)	Postemergence, following a preemergence grass herbicide	Can be used preemergence also. Do not exceed 1 lb. per acre in a season. Do not apply within 60 days of harvest. Do not use on red-skinned or early-maturing white varieties.
	Lasso	2.5-3 lb.	Annuals	Apply at drag-off	Do not use on sandy soils. Can use alone or in combination with Lorox or dinoseb.

(See footnotes on page 2.)

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<i>Crop</i>	<i>Herbicide</i>	<i>Rate of active ingredient per acre actually covered¹</i>	<i>Weeds controlled</i>	<i>Best time of application (based on crop stage)</i>	<i>Remarks, cautions, limitations</i>
Potatoes, sweet	Dacthal	6-10 lb.	Annuals ⁴ (primarily grasses)	Immediately after planting	May not control smartweed or common ragweed. Preferred on sandy soil.
	Amiben	3 lb.	Annuals	Immediately after planting	Preferred on loam soils. Do not feed foliage to livestock.
Spinach	Furloe	1-2 lb.	Annuals	Immediately after seeding	Use 1 lb. if the temperature is below 60°.
Squash Pumpkins	Amiben	3-4 lb.	Annuals	As soon after seeding as possible	Use on loam soils.
Squash	Prefar	4-6 lb.	Annuals (primarily grasses)	Preplant soil application Incorporate with soil immediately	Is primarily a grass killer. Consult label for sensitive crops within 18 months after application. Prefar can be used in rotation only with tomatoes, broccoli, cauliflower, lettuce, carrots, onions, and summer squash within 18 months of application. Use in combination with Alanap as suggested for cucumbers.
Tomatoes, direct-seeded	Dymid, Enide	4-6 lb.	Annuals	Preemergence	Do not plant other food crops on treated areas for 6 months. If used under dry soil conditions, a shallow (1 inch) incorporation as a preplant treatment may improve weed control. Can also be used on transplanted tomatoes and peppers.
Tomatoes and Peppers, transplanted	Amiben	3-4 lb.	Annuals	Wait 3 days after transplanting to apply	Use granular formulation only. Do not use on sandy soils.
	Treflan	0.5-1 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	Some reduction of growth may be possible under growth stress conditions or if rates are higher than suggested for soil type.

(See footnotes on page 2.)

Storage of Pesticides and Containers

Keep pesticides and containers in a separate building, room, or enclosure used only for this purpose. Such buildings or rooms should be dry, ventilated, and locked. Fence outside storage areas to protect children and animals and to discourage pilferage. **CAUTION:** Do not store weedkillers, herbicides, or defoliants in the same room with insecticides. Chlorate salts can create a fire or explosion hazard. Remove only the pesticides needed for one day's operation and return empty containers — and any unused pesticide — to the storage area each day.

Disposing of Pesticides and Containers

Surplus Pesticides. To dispose of surplus pesticide mixtures, try to find other areas with the same pest problem and use up any extra tank mix or rinse water on these areas. Do not drain surplus pesticides in any location where they can contaminate wells, streams, rivers, lakes, or ponds.

Operators of landfills meeting environmental safety standards can obtain supplemental permits to handle toxic waste materials, including pesticides. To dispose of large quantities of surplus pesticides, contact the Illinois EPA Division of Land Pollution Control to locate the nearest landfill with a supplemental permit for toxic waste or to obtain specific instructions about disposal.

Pesticide Containers. All empty pesticide containers, regardless of their type, should be rinsed three times before disposal. Rinse water should be dumped in the tank. Triple-rinsed containers should be punctured or broken to facilitate drainage and to prevent reuse for any purpose. They should then be hauled to a sanitary landfill for disposal. Small quantities of containers may be buried singly in open fields, with due regard for the protection of surface and subsurface water.

Illinois regulations permit the burning of combustible containers provided that they are burned on the premises where they were used, that they are burned more than 1,000 feet from residential areas, that the burning will not cause undue visibility or environmental hazards, and that no reasonable alternate disposal method is available.

Do not breathe smoke from burning pesticide containers, and do not burn containers that have weed killers such as 2,4-D or similar herbicides. When these change to a gas, the vapors may damage nearby crops and shrubbery. Pesticides containing chlorates may explode when heated and, therefore, should not be burned.

OTHER WEED CONTROL PUBLICATIONS

Obtain the following publications on weed control from the office of your county Extension adviser (agriculture) or by writing to the Office of Agricultural Publications, 123 Mumford Hall, Urbana, Illinois 61801.

Prevent 2,4-D Injury to Crops and Ornamental Plants — Circular 808;
Legal Aspects of Crop Spraying — Circular 990;
Calibrating and Adjusting Granular Row Applicators — Circular 1008;
Calibrating and Maintaining Spray Equipment — Circular 1038;
Band Spraying Preemergence Herbicides — Circular 1047;
Controlling Weeds in the Home Garden — Circular 1051;
Turfgrass Pest Control — Circular 1076;
Herbicides for Commercial Fruit Crops in Illinois — H-659;
1977 Field Crops Weed Control Guide.

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JOHN B. CLAAR, Director, Cooperative Extension Service, University of Illinois at Urbana-Champaign.

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